

IN THE CLAIMS

1. (currently amended) Apparatus for the enhancement of neurophysiological processes of a patient by the stimulation of receptive cell fields in the visual pathways of the patient between the retina and the visual cortex, the apparatus including first visual display means for viewing by said patient and computer processing means producing an output to said first visual display means to cause a display on said visual display means, said display including at least one visual cognitive exertion exercise and at least one visual stimulation image including one or more therapeutic display elements targeted to stimulate selected ones of said receptive cell fields, said therapeutic display elements including one or more moving contrast edges, wherein said therapeutic display elements are displayed on said visual display means so as to provide therapeutic stimulation to said receptive cell fields of a patient whilst said patient is performing said cognitive exertion exercise.

2. (original) Apparatus according to claim 1 further including second visual display means to be viewed by a therapist and therapist input means allowing said therapist to provide inputs to said processing means to vary said display.

3. (original) Apparatus according to claim 2 wherein said therapist inputs vary at least one visual stimulation image whilst said patient is performing a displayed cognitive exertion exercise.

4. (original) Apparatus according to claim 2 wherein said therapist inputs vary at least one of the spatial density, luminance, contrast, colour, shape, velocity or locus of movement of one or more of said therapeutic display elements.

5. (original) Apparatus according to claim 2 further including feedback means providing an indication of said patient's performance to said computer processing means, and means for indicating said performance on said second visual display means.

6. (original) Apparatus according to claim 5 wherein said feedback means includes patient input means allowing said patient to provide a response to said cognitive exertion exercise.

7. (original) Apparatus according to claim 6 wherein said patient response is auditory.

8. (original) Apparatus according to claim 6 wherein said patient response is hand written.

9. (currently amended) Apparatus according to any one of claims 6 to 8 further including means for varying said—the display on said first visual display means in response to feedback from said patient.

10. (original) Apparatus according to claim 5 wherein said feedback means includes means for monitoring brain activity of said patient to measure a response to a visual stimulation image and/or a cognitive exertion exercise.

11. (currently amended) Apparatus according to claim 10 further including means for varying said—the display on said first visual display means to optimise said patient's brain response.

12. (currently amended) Apparatus according to claim 11 wherein said—the variations to said—the display on said first visual display means are made by said computer processing means without input from said therapist.

13. (original) Apparatus according to claim 1 further including means for controlling said patient's position relative to said first visual display means.

14. (original) Apparatus according to claim 13 wherein said means for controlling said patient's position includes an electronically controllable seat capable of moving up, down and laterally, an electronically controllable backrest and an electronically controllable headrest.

15. (original) Apparatus according to claim 1 further including means to provide a different display to each eye of said patient.

16. (original) Apparatus according to claim 1 or 15 wherein said first visual display means are virtual reality goggles.

17. (original) Apparatus according to claim 1 or 2 wherein said computer processing means stores a plurality of visual cognitive exertion exercises.

18. (currently amended) Apparatus according to claim 17 further including patient input means, said output to said first display means causing a different cognitive exertion exercise to be displayed in response to an input from said patient through said patient input means.

19. (original) Apparatus according to claim 1 wherein said visual stimulation image includes a plurality of dots and annuli.

20. (original) Apparatus according to claim 19 wherein said visual stimulation image includes a dot surrounded by a contrasting annulus.

21. (original) Apparatus according to claim 19 or 20 wherein said visual stimulation image provides stimulation to concentrically organised receptive cell fields of a patient.

22. (original) Apparatus according to claim 1 wherein said therapeutic display elements include a plurality of parallel stripes having a substantially linear component of movement.

23. (original) Apparatus according to claim 1 wherein said therapeutic display elements include a first plane of parallel stripes rotating relative to a second plane of parallel stripes.

24. (original) Apparatus according to claim 1 wherein said therapeutic display elements include a brick pattern.

25. (original) Apparatus according to any one of claims 22 to 24 wherein said therapeutic display elements provide stimulation to the visual cortex of said patient.

26. (original) Apparatus according to claim 1 wherein said visual display image includes cortical stimulation elements and non-cortical stimulation elements.

27. (original) Apparatus according to claim 1 wherein at least one of said therapeutic display elements moves to at least partially obscure a displayed cognitive exertion exercise.

28. (original) Apparatus for the enhancement of neurophysiological processes of a patient by the stimulation of receptive cell fields in the visual pathways of the patient between the retina and the visual cortex, the apparatus including first visual display means for viewing by said patient and computer processing means producing an output to said visual display means to cause a display on said visual display means, said display including at least one visual cognitive exertion exercise and at least one visual stimulation image including one or more therapeutic display elements targeted to stimulate selected ones of said receptive cell fields, said therapeutic display elements including one or more moving contrast edges, wherein said therapeutic display elements are displayed on said visual display means so as to provide therapeutic stimulation to

said receptive cell fields of a patient whilst said patient is performing said cognitive exertion exercise and wherein said apparatus includes means for varying at least one of spatial density, luminance, contrast, colour, shape, velocity, orientation, direction of motion and locus of movement of said plurality of therapeutic display elements.

29. (original) Apparatus according to claim 28 including means for varying at least two of spatial density, luminance, contrast, colour, shape, velocity, orientation, direction of motion and locus of movement of said plurality of therapeutic display elements.

30. (original) Apparatus for the enhancement of neurophysiological processes of a patient by the stimulation of receptive cell fields in the visual pathways of the patient between the retina and the visual cortex, the apparatus including first visual display means for viewing by said patient and computer processing means producing an output to said visual display means to cause a display on said visual display means, said display including at least one visual cognitive exertion exercise and at least one visual stimulation image including one or more therapeutic display elements targeted to stimulate selected ones of said receptive cell fields, said therapeutic display elements including one or more moving contrast edges, wherein said therapeutic display elements are displayed on said visual display means so as to provide therapeutic stimulation to said receptive cell fields of a patient whilst said patient is performing said cognitive exertion exercise and wherein said at least one cognitive exertion exercise includes a series of successive computer activated prompts requiring a patient response, said apparatus further including input means for a patient to input a response to said prompts.

31. (original) Apparatus for the enhancement of neurophysiological processes of a patient by the stimulation of receptive cell fields in the visual pathways of the patient between the retina and the visual cortex, the apparatus including first visual display means for viewing by said patient and computer processing means producing an output to said visual display means to cause a display on said visual display means, said display including at least one visual cognitive exertion exercise and at least one visual stimulation image including one or more therapeutic display elements targeted to stimulate selected ones of said receptive cell fields, said therapeutic display elements including one or more contrast edges moving in a substantially linear path, wherein said therapeutic display elements are displayed on said visual display means so as to provide therapeutic stimulation to said receptive cell fields of a patient whilst said patient is performing said cognitive exertion exercise.

32. (original) Apparatus according to claim 31 wherein said therapeutic display elements are stripes moving in a path at least partially transverse to their longitudinal axis.

33. (original) Apparatus according to claim 31 wherein said therapeutic display elements include a dot surrounded by a contrasting annulus.

34. (original) Apparatus according to claim 31 wherein said therapeutic display elements are a pattern of bricks.

35. (original) Apparatus according to any one of claims 31 to 34 wherein the locus of movement of said visual display elements is periodically adjusted.

36. (original) Apparatus for the enhancement of neurophysiological processes of a patient by the stimulation of receptive cell fields in the visual pathways of the patient

between the retina and the visual cortex, the apparatus including first visual display means for viewing by said patient and computer processing means producing an output to said visual display means to cause a display on said visual display means, said display including at least one visual cognitive exertion exercise and at least one visual stimulation image including one or more therapeutic display elements targeted to stimulate selected ones of said receptive cell fields, said therapeutic display elements including one or more moving contrast edges, wherein said therapeutic display elements are displayed on said visual display means so as to provide therapeutic stimulation to said receptive cell fields of a patient whilst said patient is performing said cognitive exertion exercise, said apparatus further including means for generating an auditory cognitive exertion exercise including one or more auditory signals related to at least one of said visual cognitive exertion exercises.

37. (original) Apparatus according to claim 36 wherein said auditory cognitive exertion exercise is related to a visual cognitive exertion exercise displayed on said first visual display means and requires said patient to focus on said related visual cognitive exercise.

38. (original) Apparatus according to claim 36 or 37 wherein said auditory signals are computer generated speech signals.

39. (original) Apparatus according to claim 38 wherein said speech signals are acoustically modified by said computer processing means such that the temporal portion of said speech is adjusted but the spectral portion of said speech remains substantially constant.

40. (original) Apparatus according to claim 39 wherein said auditory signals are modified in response to input from a therapist.

41. (original) Apparatus according to claim 36 further including means to receive a spoken input from said patient.

42. (original) Apparatus for the enhancement of neurophysiological processes of a patient by the stimulation of receptive cell fields in the visual pathways of the patient between the retina and the visual cortex, the apparatus including first visual display means for viewing by said patient and computer processing means producing an output to said visual display means to cause a display on said visual display means and patient input means, said display including successively displayed patient interactive visual cognitive exertion exercises and at least one visual stimulation image including one or more therapeutic display elements targeted to stimulate selected ones of said receptive cell fields, said therapeutic display elements including one or more moving contrast edges, wherein said therapeutic display elements are displayed on said visual display means so as to provide therapeutic stimulation to said receptive cell fields of a patient whilst said patient is performing a displayed cognitive exertion exercise and wherein a next cognitive exertion exercise is displayed in response to input from said patient.

43. (original) A method of enhancing neurophysiological processes of a patient by the stimulation of receptive cell fields in the visual pathways of the patient between the retina and the visual cortex, the method including the steps of generating an output from computer processing means to cause a display on visual display means for viewing by said patient, said display including at least one visual cognitive exertion exercise and at least one visual stimulation image including one or more therapeutic display elements targeted to stimulate selected ones of said receptive cell fields, said therapeutic display elements including one or more moving contrast edges,

wherein said visual stimulation image provides therapeutic stimulation to selected ones of said receptive cell fields whilst said patient is performing said visual cognitive exertion exercise.

44. (original) A method according to claim 43 including the steps of receiving input from a therapist to vary said display and varying said display in response to said input.

45. (original) A method according to claim 44 wherein the step of varying said display includes the step of varying a visual stimulation image and is performed whilst said patient is performing a displayed cognitive exertion exercise.

46. (original) A method according to claim 45 wherein the step of varying a visual stimulation image includes the step of varying at least one of the spatial density, luminance, contrast, colour, shape, velocity, orientation, direction of motion and locus of movement of said plurality of the therapeutic display elements.

47. (original) A method according to claim 43 further including the step of varying the display in response to feedback received from said patient.

48. (original) A method according to claim 43 further including the step of receiving at said computer processing means feedback representing said patient's brain activity.

49. (original) A method according to claim 48 further including the step of varying said display to optimise said patient's brain activity.

50. (original) A method according to claim 43 further including the step of providing a different display to each eye of said patient.

51. (original) A method according to claim 43 wherein said visual stimulation image includes a plurality of dots and annuli.

52. (original) A method according to claim 51 wherein said visual stimulation image includes a dot surrounded by a contrasting annulus.

53. (original) A method according to claim 51 or 52 wherein said visual stimulation image provides stimulation to concentrically organised receptive cell fields of a patient.

54. (original) A method according to claim 43 wherein said therapeutic display elements include a plurality of parallel stripes having a substantially linear component of movement.

55. (original) A method according to claim 43 wherein said therapeutic display elements include a first plane of parallel stripes rotating relative to a second plane of parallel stripes.

56. (original) A method according to claim 43 wherein said therapeutic display elements include a brick pattern.

57. (original) A method according to any one of claims 54 to 56 wherein said therapeutic display elements provide stimulation to the visual cortex of said patient.

58. (original) A method according to claim 43 wherein said visual display image includes cortical stimulation elements and non-cortical stimulation elements.

59. (original) A method according to claim 43 wherein at least one of said therapeutic display elements moves to at least partially obscure a displayed cognitive exertion exercise.

60. (original) A method according to claim 43 further including the step of moving said therapeutic display elements in a substantially linear path.

61. (original) A method according to claim 60 including the step of periodically adjusting the locus of movement of said therapeutic display elements.

62. (original) A method according to claim 43 further including the step of providing to said patient an auditory cognitive exertion exercise related to said visual cognitive exertion exercise.

63. (original) A method according to claim 43 wherein said method is used in the treatment of disorders of at least one of reading, writing or speech.

64. (original) A method according to claim 63 wherein said method is used in the treatment of visual dyslexia.

65. (original) A method according to claim 43 wherein said method is used in the treatment of Attention Deficit Hyperactivity Disorder.